

# THE DIRECT CARBON or FRESSON PROCESS

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The Pictorialist has always had a soft corner for the Pigment and Control processes for good and sufficient reasons. In recent times, it is the fashion amongst those who earn their bread-and-butter through photography to damn these processes outright and hold them up as the evil example of photography which it ought not to be.

It will be conceded right away that if you are a member of the large growing tribe that is more than happy with the machine-produced, automatic-processed, computer-exposed, stabilized, resin-coated, plastic-based semi-glossy prints - adequate for block-making in quality - then these exotic processes are not for you, and it is a waste of time, effort and energy to pursue these unprofitable things. There is nothing to be gained by making a "dead dog by the dust-bin" picture, to be published in the morning paper. In order to arouse Municipal Scavenger (*Social purpose*), in multiple gum or a photograph of the local politician being pelted with rotten eggs in Bromoil Transfer. But then if you pursue beauty for its own sake, interpreting it in your own way, it is an entirely different matter.

It is the unthinking fashion to condemn the "old" pigment processes on the basis of occasional atrocities perpetrated by a few aesthetically unskilled workers - one bad Bromoil - and the whole Bromoil Process is out - in half a dozen words of outright condemnation. Why these gentlemen do not similarly condemn the bromide process, when so many millions of dreadful bromide prints are made every day, is not easy to explain!

In spite of repeated censure, often too many violations of the essential photographic character of rectitude and truthfulness in some of these processes - there is nothing inherent about such violations at all. The pigment image can be, and generally is as truthful as the "bromide" image can be.

In fact, the truthfulness of a photographic image is enhanced if the particles constituting it are not veiled from the viewer. In the pigment processes the image lies on the support, not in the emulsion-base interpack, modified by the imperfectly transparent gelatin.

Secondly, the texture of this image lends itself to infinite variations of a highly-individualistic nature and opens up great creative possibilities. The character of each pictorialist's work stands out-and is as personal as one's signature.

Thirdly, the control aspect: when theoretically "correct" tonal rendering of a real world is impossible - to what extent can you stray from that norm? In practice, except when quantitative data derivation is the aim, quite considerably. So a little change here and a little change there to emphasize the message should not cause any difficulties. The removal of irrelevant elements, that add nothing but distraction should create no psychological barriers.

Does not someone recording music try to avoid the traffic noise the braying of the donkey that are *true* but *irrelevant* by isolating himself and his apparatus in a sound-proof enclosure? If this is acceptable, why should removal of an ugly but ubiquitous electricity-supply pole or a funny unidentifiable shape in the foreground constitute photographic high crime and misdemeanour? Therefore, if you are a Pictorealist - therefore necessarily an individualist, if you like to take up technical challenges beyond the ken of the work-a-day photographer, if you are interested in the vast field of photography for its own sake, if you are interested in the inherently beautiful media of picture making, if you want a medium when your individuality and style will flourish and flower - then, and only then, come into the field of Pigment Printing. Of these, one of the most certain, one of the simplest and one of the most beautiful is the *Fresson*, or direct-carbon process which is threatening to become extinct as large exhibition-print sized negatives for the necessary contact printing are trying to pass beyond the armoury of the present-day photographer. Most present-day textbooks on photography, if they list this process at all, refer to it as obsolete. As this process can produce prints of great beauty and as beauty can never be obsolete, it is a pity this process is so considered.

Many pictorialists have called Fresson prints "photographic gems". "prints with a million dollar look" and so on.

The great Spanish pictorialist, José Ortiz Echagüe, Hon FRPS. has been the foremost exponent of this medium. He has been the only one using the Fresson process and has been doing so for more than 70 years. Anyone who has seen his work will appreciate the great beauty of this process. Up to the early 1960s, material for this process was commercially available from manufacturers in France, but is no longer available. It is, therefore, necessary to make one's own material for this process and, according to us. this in a way adds to the charm and attraction of the process.

Fresson like most of the control processes is a contact-process and needs enlarged-negatives for big prints. The Fresson process is based on the fact that colloids like gelatin, gum and so on are sensitive to light, when certain salts of chromium are incorporated into them. These colloids, when exposed to light under a negative, become differentially hardened or "tanned". The solubility of the hardened portion is less than the unhardened portion and it is thus possible to dissolve differentially the colloid carrying-pigments, and so obtain an image.

One can use any good-quality drawing-paper provided it is not too smooth. The process needs a certain amount of "tooth" in the paper. Many of the hand-made papers are very suitable. The selected paper is given a "sizing coating" with gelatin, hardened with spirit or alcohol.

The composition used is ...

Gelatin	-	10 gms
Water	-	100 cc

The gelatin is soaked for a few hours and melted in a water-bath. After all the gelatin has melted, 25 cc of alcohol or spirit is added to the above mixture. The selected paper is coated with the hot gelatin spirit mixture. The coating is applied to the paper with an urethane

plastic-foam pad and also smoothed with it. The amount of gelatin mixture used is about 10 cc per 1,000 sq cms of paper, but this again depends on the paper texture. Some more porous grades will, perhaps, need a second coating. The paper will dry in an hour's time. Some brands of paper do not need this sizing. But it is better to apply sizing to all grades of paper.

The sized-paper is pinned upon a board and is ready for the emulsion coating. The emulsion is prepared as follows:

Soft gelatin - 100 gms  
Water - 100 cc

*Note: The soft gelatin should be dissolved in 100 cc of water and NOT 10 cc. The original published article mentioned 10 cc of water: but this error is already corrected in this text-version.*

The gelatin is soaked and melted as mentioned earlier. The temperature is kept at about 40°C. To this is added ....

Starch (fine) - 4.5 gms  
Water - 20 cc

The temperature should never exceed 40°C, so that the starch remains raw and does not become cooked.

The pinned-up paper is coated with the emulsion at the rate of 10 cc for about 1,000 sq cms of paper area. The warm emulsion is stirred to distribute the starch evenly and then the necessary amount is measured and poured on to the paper (pinned on a board) and spread using a plastic-foam pad (urethane plastic). This pad is first soaked in the emulsion to saturate the pores. It is also used to smoothen the coating. At this stage, there may still be some unevenness in the coating. The coating is then allowed to become slightly tacky and evened up with a plastic-foam roller-brush, of the type used for painting walls and so on. The coated paper is allowed to dry. In the meantime, one has to prepare a 35 per cent gum arabic solution. The gum arabic used should be granular, not in the form of tears or powder. It is best dissolved by rubbing it in a mortar, a little at a time, with portions of the measured quantity of water. The gum solution is then filtered through muslin cloth. This gum solution is preserved against mouldy growth with (about 0.5 gms per 100 cc) mercuric chloride (*highly poisonous*). One can, instead, use a few drops of an antiseptic like *Dettol* as a preservative. This does not preserve the gum against mould for more than a few months. However, it is non-poisonous.

The following mixture is prepared in the form of a paste. It is then spread on a glass plate with a palette knife and left to dry. When dry, the mixture is ground-up in a mortar, sifted and stored.

*Pigment mixture:*

Lamp black - 3 gms  
35 % gum solution - 6 cc  
Pure soap - 0.5 gms

Shavings of Pear's Glycerine soap are quite suitable. Fairly good substitutes for this pigment-gum mixture are the different types of powder water-colour mixtures. Winsor and Newton's levitated powder-colours are quite satisfactory.

The emulsion-coated paper is pinned-up on a board under which a large sheet of paper is placed to collect any excess powder. The paper is repeatedly rubbed with the gum-pigment mixture, either with a bristle brush or preferably with a dry plastic-foam pad. When the maximum adhesion (indicated by a slightly shiny surface) is obtained the paper is dusted with a soft brush to remove the excess powder. This process is somewhat messy with the fine powder spreading all over the place (including the nose of the person carrying it out). It is, therefore, best done in some shed or in the open with a good face-mask. The final colour obtained is somewhat pale. But as the depth of tone increases considerably by the time the print is made, it need not cause any worry. The paper thus prepared will be usable in cool and dry weather for a couple of months.

The prepared paper is sensitized by immersion in the following sensitizer ....

Potassium dichromate	-	8 gms
Sodium citrate	-	3 gms
Wetting agent	-	a few drops
Water	-	1.00 cc

Since the sensitizing solution has a tendency to dissolve the gelatin, it is necessary to use the sensitizer at low temperatures. The sensitizer temperature should be at about 10°C, or lower. The pigment-paper is sensitized by immersing it, face up, in the cold sensitizer. After the paper is fully-wetted it is kept in the solution for about 1 ½mins. It is dried by pinning it upon a board. The paper is sensitive only when dry. It will not keep for more than about 48 hours after sensitization, and best printed within 24 hours.

The best negatives are on film or plate, which have rich half-tones. They should also be nice and transparent without any base fog. Paper negatives can also be used, but need much longer exposures (about 6 to 8 times as much as film negatives). The printing is done in bright sunlight. Under tropical conditions, in bright sunlight, the exposures run to about 2 or 3 minutes for normal negatives.

Developing should be done almost immediately after exposure. The exposed print is first immersed in cold water for 10 minutes. The water is changed a few times to get rid of the excess dichromate, from the paper base. It is then transferred to warm water at 32°C for a further 10 minutes. In this soak the image is sometimes visible and the unexposed border tends to develop out.

The development of the Fresson print is unique in many ways. The developing agent is fine sifted saw-dust - yes, saw-dust! The development is done by using a soup-like mixture of fine saw-dust and water. The saw-dust should be free from tanning and should be light-coloured, as dark-coloured varieties tend to stain the base of the print. Box-wood saw-dust is very suitable. It should be sifted with a 30-mesh sieve and stored.

The soaked print is clipped on to a galvanized iron sheet. which has the 2 long edges bent up by about an inch to prevent the saw-dust soup running off. This sheet should be a few inches larger on all sides than the print being processed. The sheet is placed at a slope of 30 to 45°. The soup is poured repeatedly on to the differentially-tanned and soaked print. A small mug, with a spout or lip, is very useful for pouring the saw-dust soup on to the print. The friction of the water and saw-dust mixture running down the print surface gradually removes the softer areas (highlight) of the print. For a 15 x 12 in print, some 4 to 5 litres of the saw-dust soup will be needed.

The development is continued till a satisfactory result is obtained. The most delicate results are obtained with short exposure and a low-temperature soak, in fact, as low a temperature as 27°C. Some prints may take a long time for development, but a properly-exposed and soaked print should be developed in less than 5 minutes, apart from local control. After the development is carried to satisfaction, the print is rinsed in cold water to remove any bits of saw-dust that may be adhering to it. The print surface at this stage is quite delicate and should therefore be handled very carefully. The print tends to dry somewhat darker than it appears when wet and, therefore, development should be continued until it appears a trifle lighter than needed. It is dried by pinning up on a board. While the print is still wet, black spots and so on can be carefully removed with a fine brush. If the print is accidentally some-what overexposed, one can get a passable result from a somewhat warmer soak at temperatures as high as 35°C. However, it should be noted the hotter soaks tend to produce more contrasty and grainy results.

### **Variations of contrast**

Short exposures and colder soaks tend to produce lower contrasts. On the other hand long exposures with a warmer soak tend to increase contrast. A weaker sensitizer will also increase contrast, with correspondingly-reduced printing speeds. Similarly, a sensitizer with a higher concentration of dichromate will reduce contrast, but this is not very reliable, as the emulsion tends to melt in these stronger solutions, even at low sensitizer temperatures. It is best to avoid any dichromate concentration greater than 2 per cent.

### **Control of Fresson**

It is extremely easy to make tonal modifications. Areas which are to be darker can be obtained either by avoiding the pouring of the soup on them or by tilting the sheet at such an angle in order to avoid the soup running over such areas. Similarly, areas can be lightened by pouring more soup over them. Small areas such as the catch light in an eye and so on can be brought out by using a fine brush to pick them out on the wet print.

If the print looks a little too dark after drying, it may be soaked in cool water, placed for 1 min in water 3° to 4° warmer than used in the first stage and redeveloped again with the saw-dust soup. The prints can be spotted using the same pigment mixture. Black lines, spots, and so on can be removed with a sharp knife or one can very effectively use a typewriter- or ink-eraser. Large areas can also be lightened similarly with corresponding care.

When these instructions are carefully followed a superb print will result with exquisite print quality.

## Variations:

It is possible to use pure pigment-powder instead of the recommended gum-pigment mixture. One can produce very good prints by this method. However, this process is somewhat more uncertain, and the coating of the paper with the pigment is much more messy. A face-mask is absolutely essential. A plastic-foam-pad is better than a bristle brush. This method should be avoided in the beginning until one becomes experienced in the process.

We are now engaged in further experiments which are designed to improve the process and make the paper-making less messy. Preliminary results are quite encouraging and we hope to have full details worked out in about a year's time. We feel strongly that initial experiments are best done with black colour as it is much easier to get good quality with black pigment than with other lighter colours. We invite correspondence from those who experimented with Fresson. We sincerely hope this article will rekindle interest in this unique process and that here will be many workers using it. So saving it from extinction.

### Footnote:

*Dr C. Badrinathan is at The Tata Institute of Fundamental Research, Bombay. 400-005. India. He contributed a letter to the Editor which was published in the issue of The Journal dated July/August, 1977, page 215. C. Rajagopal is his cousin who lives in Bangalore.*

*Note: The following images published in the original article are omitted in this document:*

- *A Man of many troubles, C. Rajagopal, p. 131*
- *Mirrored, Badrinathan, p. 131*
- *Sunlit, C. Badrinathan, p. 132*
- *White Cottage, C. Badrinathan, p. 132*

*Note: this erratum was published in the The Journal, issue sep/oct 1978, p 224.*

### *Formula Correction:*

*We have been advised by Dr C. Badrinathan that there was an error in the published formula for the emulsion in the contribution about The Fresson Process (see The Journal, issue dated May/June, 1978, page 132, right-hand column).*

*The soft gelatin should be dissolved in 100 cc of water and NOT 10 cc.*